CLAIMS

1. A process for the isolation and identification of one or more pharmaceutically relevant target compounds (TC) from a sample that directly and/or indirectly bind(s) to a compound of interest (COI), said compound of interest (COI) being associated with a given impaired condition or disease, comprising the following steps:

   a) providing said compound of interest (COI), preferably being bound to a suitable solid support material,

   b) adding said sample to the compound of interest (COI) from step a), preferably under physiological conditions, resulting in the direct or indirect binding of one or more of the components from said sample (CS) to the compound of interest (COI-CS complex formation),

   c) isolating and purifying said complex (COI-CS) from step b) and/or its components,

   d) identifying the component(s) of said complex (COI-CS),

   e) identifying at least one target compound (TC) of said complex (COI-CS) that is hitherto unknown to directly or indirectly bind with the compound of interest (COI) and, optionally

   f) further purifying said target compound.

2. A process for the identification of a pharmaceutically effective compound useful for preventing and/or treating a given impaired condition or disease comprising the steps of

   (i) selecting one or more pharmaceutically relevant target compounds (TC) that is capable of directly or indirectly binding to a compound of interest

(COI), said compound of interest (COI) being associated with a given impaired condition or disease, comprising the following steps:

a) providing said compound of interest (COI), preferably being bound to a suitable solid support material,
b) adding a sample containing target compound(s) to the compound of interest (COI) from step a), preferably under physiological conditions, resulting in the direct or indirect binding of one or more of the components from said sample (CS) to the compound of interest (COI-CS complex formation),
c) isolating and purifying said complex (COI-CS) from step b) and/or its components,
d) identifying the component(s) of said complex (COI-CS),
e) identifying at least one target compound (TC) of said complex (COI-CS) that is hitherto unknown to directly or bind interact with the compound of interest (COI);

(ii) employing one or more of the target component(s) (TC) identified in step (i) e) in a screening assay for the identification of pharmaceutically effective compounds.

3. A process according to claim 1 or 2, wherein the sample is derived from a mammal, preferably from a human, more preferably from a mammal suffering from said impaired condition or disease, most preferably from a human suffering from said impaired condition or disease.

4. A process according to any one of claims 1 to 3, wherein said impaired condition or disease and/or said sample is associated with an impaired condition or disease which is selected from cancer; neurodegenerative diseases, preferably Alzheimer's disease or Parkinson's disease; inflammatory diseases, preferably allergies or rheumatoid arthritis; AIDS; metabolic diseases, preferably diabetes mellitus; asthma; artheriosclerosis; coronary and heart diseases; and infectious diseases.

5. A process according to any one of claims 1 to 4, wherein said compound of interest (COI) is selected from any type of biomolecule, preferably a protein, a peptide, a lipid, a carbohydrate, or a nucleic acid.

6. A process according to claim 5, wherein said compound of interest (COI) is TNFalpha.

7. A process according to any one of claims 1 to 4, wherein said compound of interest (COI) is selected from any type of a synthetic compound, preferably a protein, a peptide, a lipid, a nucleic acid, or a synthetic organic drug, more preferably a small molecule organic drug.

8. A process according to claim 7, wherein said compound of interest (COI) is selected from the group consisting of benserazide, sulindac or parthenolide.

9. A process according to any one of claims 1 to 8, wherein said physiological conditions in step b) are selected from a physiological cellular protein concentration, a physiological pH, a physiological buffer capacity, a physiological osmolarity, and a physiological temperature.

10. A process according to any one of claims 1 to 6 and 9, wherein said isolating and purifying of said complex or its components in step c) is accomplished at least in part by the TAP-technology.

11. A process according to any one of claims 1 to 10, wherein said identification of the complex components in step d) is accomplished at least in part by a technique selected from the group consisting of specific antibody binding, peptide-sequencing, Maldi-TOF, electrospray-mass-spectrometry.

12. A process according to any one of claims 1 to 11, wherein said identification of at least one component of said complex (COI-CS) in step e) is achieved by comparing the chemical structure and/or physical properties of said component(s) being identified in step d) with the information available in suitable sequence databases and/or substance libraries.

13. A process according to any one of claims 2 to 12, wherein said screening assay in step (ii) comprises

A) contacting one or more target compound(s) (TC) selected in step (i) e) with a compound suspected to be pharmaceutically effective, and

B) determining the presence of a chemical and / or physical binding among the compound(s) (TC) and the compound of step A)

14. A process according to any one of claims 2 to 13, wherein said compound of step A) is selected from a suitable compound library.

15. A process according to any one of claims 13 to 14, further comprising the step of contacting of one, some, or all of the remaining components of the COI-CS complex identified in step d) with a compound suspected to be pharmaceutically active according to step A).

16. A process for the identification of new uses of an active agent comprising the following steps:

a) identifying a binding molecule for the active agent;

b) identifying cellular binding partners of the binding molecule under physiological conditions, and

c) identifying medical indications linked to one or more of the binding partners of step b)